



Making a Splash with Pooled-Fund Research

How can a small state like New Hampshire increase the worth of its By participating in a pooled-fund project, that's how! Pooling resources allows the Department to leverage its funds toward projects it could not accomplish alone, thereby providing substantial benefits to the State of New Hampshire.

To qualify as a pooled fund study, more than one state transportation, federal or other agency such as a municipality or metropolitan planning organization, college/university or private company must find the subject matter important enough to commit funds or other resources to conduct the research, planning, or technology transfer activity.

We often think that a particular problem we're facing in the field, office, or workplace is unique to our circumstances and environment. In reality, it's likely that the problem exists elsewhere in the transportation community as well. For example, a condition affecting a snow plow in northern New Hampshire may mirror a similar situation in Maine, Minnesota, or Colorado.

This issue of *Focus on Research* highlights three pooled-fund programs in which the NHDOT participates.

Transportation Pooled Fund (TPF) program

<http://www.pooledfund.org/>

This program consists of individual studies initiated by a lead organization (usually a State DOT or FHWA), which seeks partners to help finance and direct the project. Participating states are generally represented on a Technical Advisory Committee (TAC), which develops the project scope and oversees the research.

In December 2002, a new interac-

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research dollars two, ten or even twenty fold? sources with other organizations to reach a common goal allows the Department to leverage its funds toward projects it could not accomplish alone, thereby providing substantial benefits to the State of New Hampshire.

Feature Pooled-Fund Project

"Field Evaluation of A New Compaction Monitoring Device"

Highway construction requires that soil be placed and compacted as structure and utility backfill, embankment fill and roadway base preparation. Current-day compaction quality control equipment on NHDOT projects usually consists of the nuclear densometer or the sand cone. The drawbacks of these devices include high purchase cost, operator certification and training, expensive licensing and maintenance, and potential health hazard for the nuclear densometer; extensive training/experience, long test duration, high operator error potential, and disruption of contractor activities for the sand cone test.

The New England Transportation Consortium (NETC) has recently completed Project 01-6 "Field Evaluation of A New Compaction Monitoring Device". The report indicates that the Soil Compaction Supervisor (SCS) performs well as a QC tool for monitoring a wide variety of soils when at least 95 percent compaction is specified, based upon standard Proctor density (AASHTO T-99, with coarse particle correction). Materials & Research Bureau Soil Technician Ken Cogswell represented New Hampshire by serving as chairman of the NETC Technical Committee for this project. "I found the technology to be useful, and it could be incorporated into the NHDOT testing 'toolbox'," says Ken.

Foster-Miller, Inc. and MBW, Inc. developed the SCS. It consists of a hand-held meter and a disk shaped disposable polymer-based piezoelectric sensor, which is connected to the meter by a wire. The meter has an internal memory for downloading to a personal computer.

The general theory of operation of the SCS is based upon a mathematical procedure referred to as the "Peak Detect Algorithm". The sensor disk is placed at the bottom of the fill. The sensor produces a voltage in response to compression waves transmitted through the soil from the compactor. The voltage is proportional to the strength of the pressure wave reaching the sensor, which is dependent on the density of the soil. When the soil is loose, the pressure wave transmission efficiency is low. The corresponding voltage response is also low. As the soil becomes more compact, transmission efficiency and the sensor voltage increase, and eventually level off. The "Peak Detect Algorithm", programmed into the meter, determines that



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Transportation Pooled Fund (TPF) program

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tive web site was launched through the joint sponsorship of AASHTO, FHWA, and the Transportation Research Board. The new web site provides a centralized information source about the TPF Program for partners as well as the interested public, and includes program procedures and information about each study. Authorized users in the States and FHWA may post study solicitations, make funding commitments, update study records, and view funding reports. The Department is a participant in a number of completed, ongoing and proposed TPF projects, which can be viewed at:

<http://www.pooledfund.org/orgdetails.asp?id=30>.

New England Transportation Consortium (NETC)

http://www.cti.uconn.edu/ti/Research/netc_home.htm

The NETC is a regional pooled-fund program jointly funded by the six New England States and FHWA. The NETC was formed as a regional approach to developing innovative solutions to common transportation problems among the New England states. The six land-grant Universities in the region participate in an advisory fashion in the NETC and are awarded the majority of the contract research. By pooling the financial, professional and academic resources of the region, improved methods of dealing with common problems in the planning, design, construction, maintenance, rehabilitation, reconstruction and operation of transportation systems in the participating states have been realized. The program is intended to supplement, not to replace, ongoing state and federal research activities and other national programs such as NCHRP.

Unlike the TPF program where the Department participates only in selected projects, the NETC is a defined-contribution program with each agency currently providing \$100,000 per year. An Advisory Committee prioritizes problem statements collected each year and develops the annual program based on available funding. Jim Moore, Assistant Director of Project Development, is NHDOT's representative on the NETC Advisory Committee. A number of Department personnel participate in project technical committees developing and guiding the research.

National Cooperative Highway Research Program (NCHRP)

<http://www4.trb.org/trb/crp.nsf>

Almost every transportation professional has been impacted by the NCHRP during his or her career. The NCHRP was created by AASHTO in 1962 as a means to conduct research in acute problem areas that affect highway planning, design, construction, operation, and maintenance nationwide. The *Highway Capacity Manual*, federal crash testing guidelines (*NCHRP Report 350*), and the *Synthesis of Highway Practice* series are just three examples of commonly used products that have emanated from the program.

The AASHTO Standing Committee on Research (SCOR) meets each March to select projects for the NCHRP. Past members of SCOR from NHDOT include former Commissioners Leon Kenison and Chuck O'Leary. Department personnel occasionally participate in project panels overseeing individual NCHRP studies.

For More Info

Visit the NHDOT Research Website at <http://www.t2.unh.edu/nhdotresearch/index.html> or contact the Research office at 271-3151.

"Field Evaluation of A New Compaction Monitoring Device"

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compaction has been achieved and signals the condition by a light on the meter. A single sensor can be used to monitor the compaction of several successively placed lifts of fill to a depth of about four feet.

The study identifies the advantages of the SCS to be: inexpensive to purchase and maintain, minimal operator training, short test duration, no licensing and no health safety hazards. A limitation of the device requires that the operator be capable of judging suitable placement conditions, such as the moisture content of the placed soil. The SCS was not reliable in cohesive soils such as clay, due to excessive moisture content in the material.

